



"Providing network-integrated robotic solutions for C4ISR applications."

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Force Protection Joint Experiment Evaluates Technology Effectiveness

The SSC Pacific Unmanned Systems Branch recently supported the Force Protection Joint Experiment (FPJE), created under the direction of the DoD Physical Security Equipment Action Group (PSEAG), with concurrence from Joint Project Manager Guardian (JPMG) and Product Manager-Force Protection Systems (PM-FPS). The FPJE exercised applicable Integrated Unit, Base and Installation Protection (IUBIP) concept of operations (CONOPs) and assessed viable technology solutions against relevant force-protection threats, including chemical, biological, radiological, nuclear and ex-



MDARS PUV with dual FN-303 less-than-lethal weapons.

plosive (CBRNE) sensors. The FPJE was guided by a Joint Oversight Committee that chartered a Joint Inte-

grated Product Team to plan and execute each event. Efforts involved collaboration across all services, which

included combat developers, material developers, the science and technology community, and other force-protection agencies. The SSC Pacific Unmanned Systems Branch was the lead integrator in charge of the technical effort.

The FPJE involved a focused series of four scientific experiments, each of which was preceded by technical integration sessions and modeling and simulation (M&S) events. The experiments involved the joining of a group of systems or technologies to form a system of systems. The "System" is the collective set of systems

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SPAWAR Reservists Participate in "Southern Conquest"



EMC (SW) Clift and CTT1 Alvarez troubleshoot an inoperative EOD robot during "Southern Conquest"

SPAWAR Robotics Reservists CDR Lester Gong, EMC (SW/AW) Kyle Clift, and CTT1 Jon Alvarez recently participated in the Army National Guard's

"Southern Conquest" explosive ordnance disposal (EOD) training exercise conducted at the Fort McClellan Army National Guard Training Center in Alabama.

The exercise, hosted by the 111th Ordnance Group (EOD), took place between 28 April and 08 May 2008, with over 200 soldiers representing EOD units from eight different states. "Southern Conquest" was conceived as a means to offer realistic training for troops being deployed overseas to destinations including Iraq, Kuwait, Afghanistan, and Kosovo. The train-

ing consisted of one week of classroom instruction, followed by one full week of scenario-based field exercises requiring a coordinated response to simulated EOD incidents.

The SPAWAR Robotics Reservists participating in "Southern Conquest" provided equipment, maintenance support, training assistance, and mentorship for the EOD soldiers taking part in the exercise. The SSC Pacific Robotic Systems Pool supplied robots for the mission. The SPAWAR team offered classroom instruction

as well as informal opportunity training covering general robot operation and common maintenance issues.

In addition, the SPAWAR Robotics Reservists accom-

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SPAWAR reservists employ a PackBot during an improvised explosive device incident-response operation.

Force Protection Joint Experiment (continued)



AFRL Defender UGV with M-249 on patrol during IA-4

working in a synergistic fashion to address the force-protection mission.

The four experiments were executed as integration assessments (IAs) at sites C3, C5, and A13B at Eglin Air Force Base (AFB), FL during the period 5 March 2007 through 14 March 2008. The first event, IA-1, was the baseline experiment that integrated the primary command and control (C2) elements with legacy sensor systems, including the US Army MDARS. UGV IA-2 then focused on the integration of industry partner equipment selected through an RFI executed by the US Air Force. IA-3 was strictly an integration event that extended the area of operation to include sea and air domains.

The fourth experiment of the FPJE, IA-4, was the culmination of the year-long project. The primary objective was to evaluate the impact of increased data fusion and automation on system performance, as well as continued evaluation of overall system effectiveness. While IA-3 was primarily a systems integration exercise, IA-4 focused on software enhancements aimed at maximizing sensor data fusion and system automation in order to increase situational awareness and decrease operator task loading.

Each formal experiment included a series of validation exercises that involved pitting opposing forces (OPFORs)



Edgewood Chemical Biological Center CBRN UGV preparing for day operations.

against the system, with the goal of defending mission-essential assets (e.g., aircraft) from attack using the technical solution. Directed by a Battle Captain, operators would employ sensors and unmanned systems to detect and assess potential intrusions. Extensive data collection was performed to evaluate effectiveness in performing the detect, assess, warn, defend, and recover functions. In general, the system enhanced the effectiveness of security forces and saved lives through the employment of unmanned systems as a first response to an attack.

In all, the IA-4 force-protection solution featured 18 major subsystems supported by 15 different agencies, 190 sensors from the air/land/sea domain covering 320 square kilometers, three different sites separated by nearly 52 kilometers, four different classes of unmanned systems, seven different CBRN sensors, both lethal and non-lethal remotely operated weapons systems



Radiance Technologies ROWS package on AFRL Defender platform.

(ROWS), four different radars, 31 imagers, and over 1900 meters of fence fiber – all operated (save the RAVEN and CUGV unmanned systems) with as few as two individuals using the Joint Battlespace Command and Control System (JBC2S), created by the Unmanned Systems Branch.♦



Battle Captain's station monitors operators employing unmanned systems during intrusion experiments.

SPAWAR Robotics Reservists (continued)



CTT1 Alvarez evaluates new man-portable robot technology during "Southern Conquest."

panied EOD response teams on their simulated missions in the field. From this, they

better understood EOD-specific operational requirements, techniques, and procedures. Based on this direct interaction they were also able to offer the EOD technicians suggestions for improving the effective use of their robots, taking full advantage of the technology's systems and capabilities.

The Navy personnel who supported the "Southern Conquest" exercise are members of the Robotic Systems Combat Support Team.

Led by CDR Gong, the team provides ongoing operational and technical support to SSC Pacific's Unmanned Systems Branch. Members have been deployed for service in Iraq, Afghanistan, and numerous regions throughout the United States. Many, including EMC Clift and CTT1 Alvarez, have previously supported other National Guard EOD training exercises such as "Raven's Challenge" at Fort Lewis and "Empire Challenge" in New York.♦

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